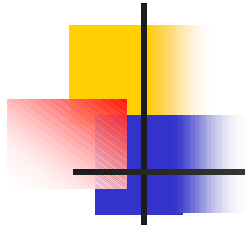


# Fort Carson Solar Energy Applications





# Introduction

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- Presenter: Richard Pilatzke
- Water Programs Manager -Fort Carson

# Welcome to Fort Carson





# Fort Carson Overview

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- Located in central Colorado
- Over 500 sq mi of training lands
- 15,000 Active Duty Troops
- Major Army Mechanized Training

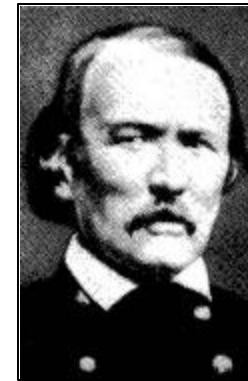




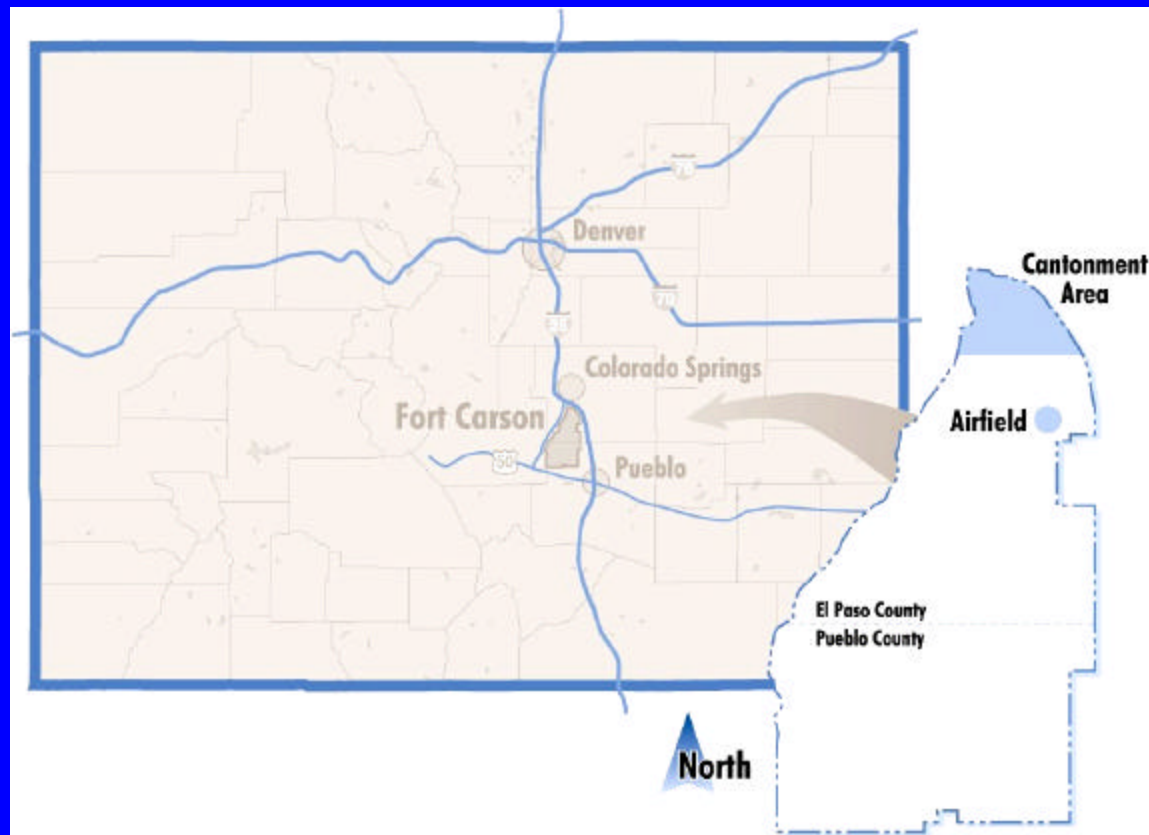
# Installation Background

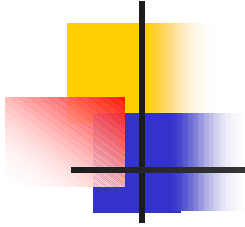
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- Camp Carson was built in 1942; named after General Christopher “Kit” Carson.
- Renamed Fort Carson in 1954.
- Originally used for infantry and cold weather training; also housed German and Italian POWs during WW II.
- 140,000 acres at the main post, plus 237,000 acres at Pinon Canyon Maneuver Site.



# Fort Carson Location Map

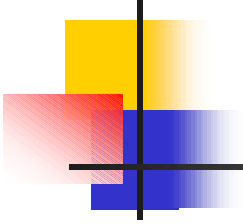




# Fort Carson Mission

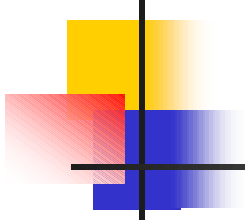
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- “Training, mobilization, deployment and sustainment of combat-ready forces.”



# Tactical Armor

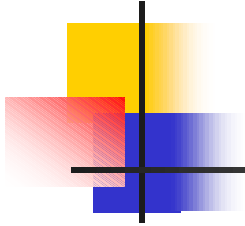




# Geographical Challenges

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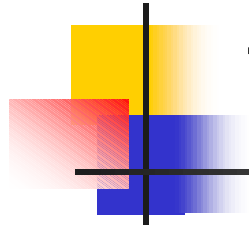
- 500 Square Miles of Installations
- Many off-grid applications
- Many projects are only possible because of solar power



# Fort Carson Energy Program Awards

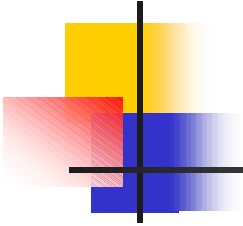
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- FY85 Sec Army Energy Award
- FY87 Energy Awareness Week Award
- FY87 Federal Energy Efficiency Award (Individual)
- FY89 Federal Energy Efficiency Award
- FY89 Sec Army Energy Award
- FY94 Sec Army Energy Award
- FY94 Federal Energy and Water Management Award
- FY95 Federal Energy and Water Management Award (Individual)
- FY96 Federal Energy Efficiency Award (Installation)
- FY96 Federal Energy Efficiency Award (Small Group)
- FY98 Sec Army Energy and water Conservation Award

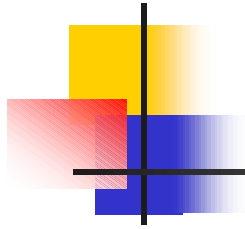


# Transpired Solar Walls

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Solar Wall used at Butts Army Airfield



## BAAF Solar Wall

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- 7800 sq ft solar wall
- 37,500,000 BTU/yr
- 6.8 yr payback



FORT CARSON ARMY BASE, Colorado Springs, Colorado USA



250 sq.ft. SOLARWALL panels for battery storage building



One fan and distribution ducting connected to SOLARWALL ventilates building

## Solar Wall in Battery Storage Building



## Solar Wall In Design

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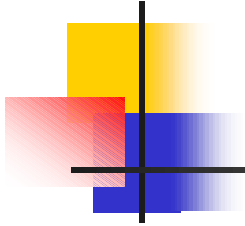
- 4 year payback
- Original design specification



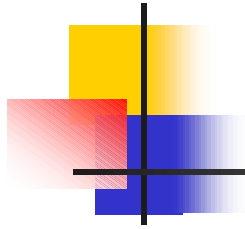
## Solar Wall Facts

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- up to 75% Solar Efficiency
- Low cost, fast payback
- Most economical solar application



Fed Ex Building in Denver, Colorado

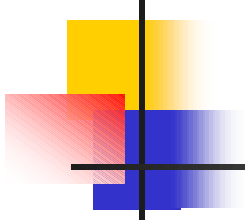


## Fed Ex Distribution Center, Denver

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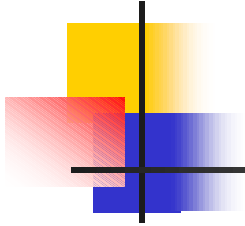
- 5,000 sq ft solar wall
- 2,300 million BTUs/yr
- Energy savings \$12,000/yr
- Payback approx. 4 yrs



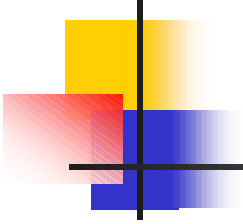


# Solar Heating

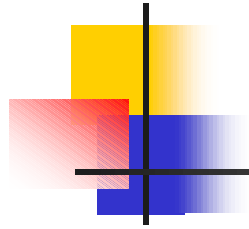
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Solar panels are used to heat Fort Carson's indoor pool

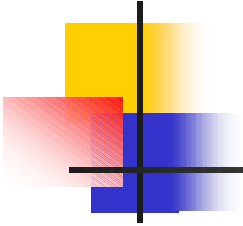


## Fort Carson Solar Energy Applications



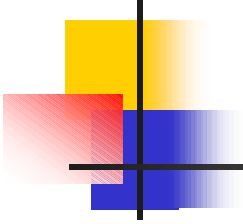
# PV Power Applications

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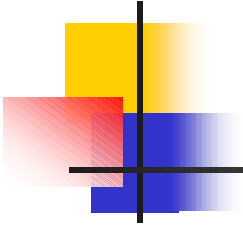


Fort Carson Golf Course SCADA system

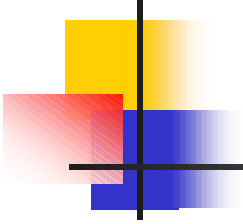




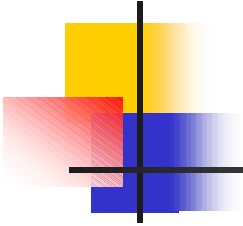
Solar pumps  
on fuel tanks



Solar atrium at Fort Carson's Evans Army Community Hospital.

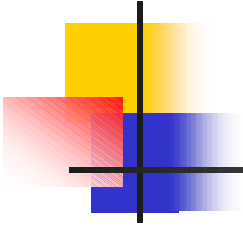


Solar Design at Evans Community Hospital

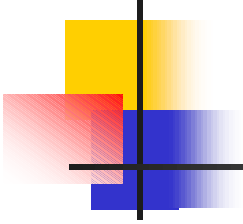


Solar design used at Fort Carson's Outdoor  
Recreation building

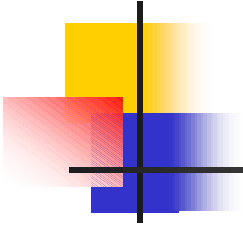




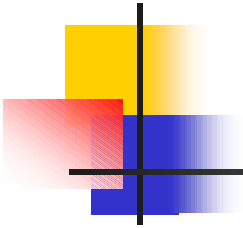
Meteorological Monitoring  
Station



Telemetry Station on Booth Mountain

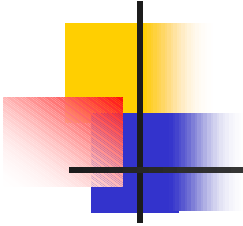


Solar energy panels  
power several traffic signals on post

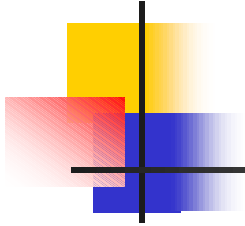


Solar pump used to power a well

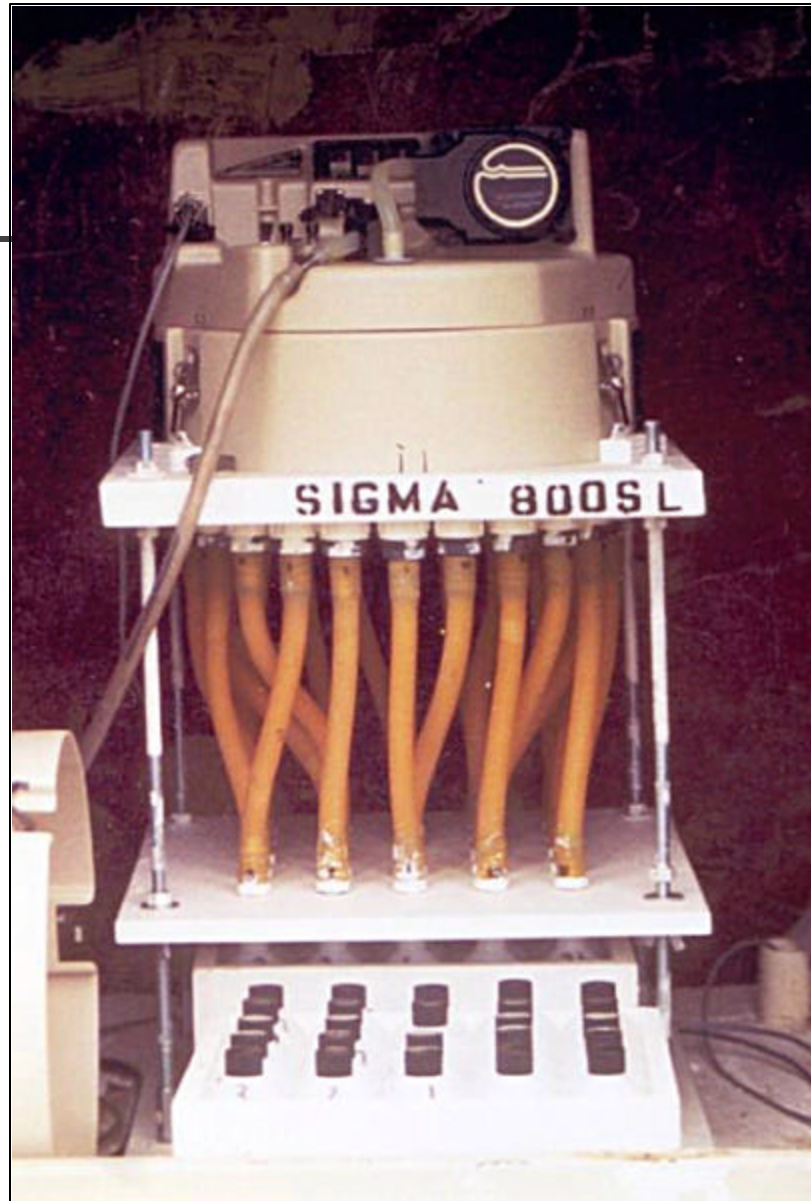




Solar-powered pump at Fort Carson Middle School  
Instructional Constructed Wetland



Turkey Creek Ranch entry sign powered by  
solar energy



Remote CS  
sampler



Heavy equipment (Kubota tractor) using  
solargizer





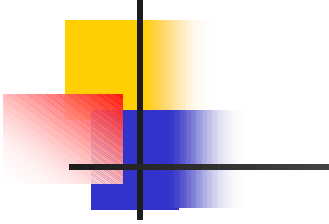
Solargizer on Humvee



Military Solargizer

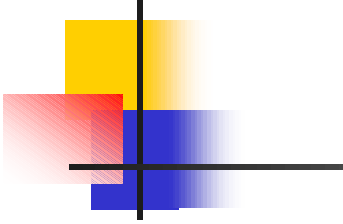


John Deere Tractor

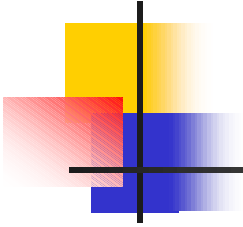


Pesticide Applicator





Dump Truck



PV panels are used to provide power for a composting toilet at Fort Carson's Ironhorse Park



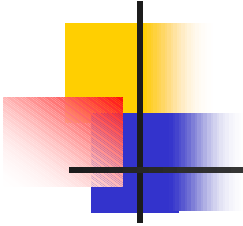
An evaporative composter at Fort  
Carson's golf course

## Flying G Camp Colorado



## Curecanti NP Colorado





Bonfils Center for the Disabled, Winter Park, CO



Buffalo Pass USFS Colorado



Cedar Hill Park  
COE Texas



Aurora Reservoir Colorado



Pere Marquette Trail  
Michigan





Bryce Canyon NP Utah



Charlie Elliot Wildlife Ctr  
Georgia





Horse Park Coconino NF  
USFS Arizona



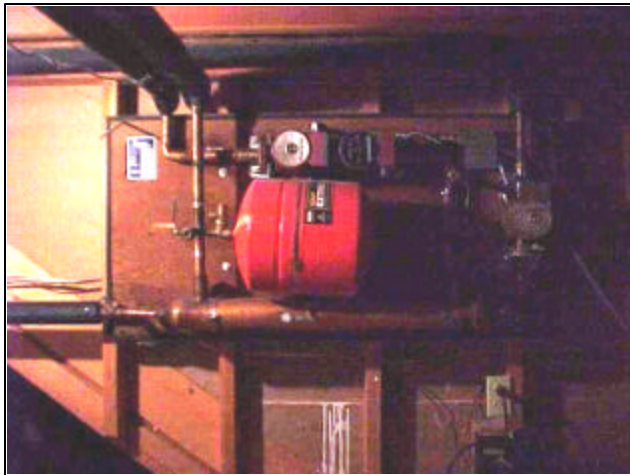
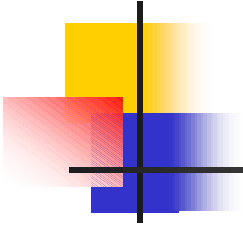
Hahns Peak  
USFS  
Colorado



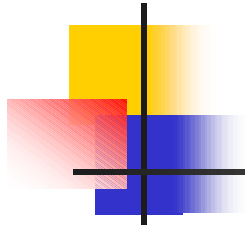
Wyoming State Parks  
Several locations



Maroon Bells USFS  
Colorado



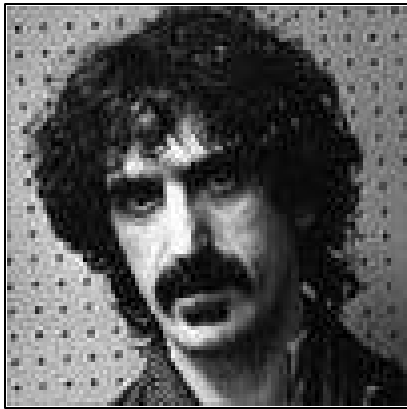
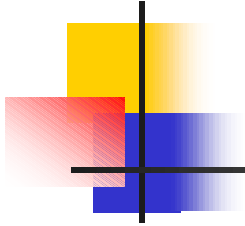
Solar energy for home use



## Future Directions for Fort Carson

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- Sustainable Design Training Building
- Installation Design Guide
- Additional Solar Applications (MOTS)



"There is more stupidity than hydrogen in the universe, and it has a longer shelf life."  
Frank Zappa





The end